



Explosive Azides

Lawrence Berkeley National Laboratory Lessons Learned

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Concern Statement: A recent incident involving sodium azide resulting in a minor injury highlights the precautions necessary when working with these potentially explosive compounds. Most azides are explosive under appropriate conditions, and should be handled carefully and protected from light, shock, and heat.

Applicable to: Researchers and staff who work with heavy and light metal azides.

Incident: A chemist was conducting maintenance on a small brass filter, an air drying system component connected to a water container. As the chemist was cleaning the filter with a wire brush a small explosion occurred that resulted in minor blistering of the left thumb and index finger. Because this cleaning operation was being performed in a chemical fume hood, the energy from the explosion was somewhat contained. The employee sought medical treatment at Health Services and returned to work the same day.



Brass filter following explosion

Cause: Sodium azide was added in very low concentrations (~0.05%) to prevent algal growth in the water container of the air-drying unit. A small amount of sodium azide was deposited on the brass filter during normal operation of the unit. The sodium azide reacted with the copper in the filter to form a potentially explosive mixture sensitive to both shock and friction (such as cleaning with a wire brush).

Recommended Actions

- ❑ Substitute less reactive materials for metal parts when azides and metal parts can form reactive mixtures (in this case, the brass filter was replaced with a PVC tube).
- ❑ When substitution is not feasible, thoroughly wash metal parts before exposing them to sources of potential friction or shock.
- ❑ Consider an alternate material to suppress algal growth.
- ❑ All employees working with azides must be current on EHS0348, Chemical Hygiene & Safety Training, before handling these materials. In addition, reference materials, such as Material Safety Data Sheets or MSDSs, should be reviewed to identify the specific hazards and necessary precautions when working with particular azide compounds.

Further Information

Any additional assistance or questions regarding these incidents or the lessons learned may be directed to Jack Salazar (x6571).

For other lessons learned, go to: http://www.lbl.gov/ehs/html/lessons_learned.htm.